UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _31 January 2008_.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-33_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-33_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _12/22/2007_.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____ .

DETAILED ACTION

1.   Claims 1-33 are presented for examination.

Information Disclosure Statement

2.   The information disclosure statements filed 10/04/2004 has not been considered

by the examiner. The information cited is "related applications". Applicant should place

this information in the "related applications" section of the specification for consideration

by the Examiner. Correction is required.

Claim Rejections - 35 USC § 101

3.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
> matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
> conditions and requirements of this title.

4.   Claims 23-33 are rejected under 35 U.S.C. 101 because the claimed invention is

directed to non-statutory subject matter. Claims 23-33 recite an "apparatus" and a

"mechanism"; however, it appears that the apparatus and mechanism would reasonably

be interpreted by one of ordinary skill in the art as software, per se, failing to be tangibly

embodied or include any recited <u>hardware</u> as part of the system. Mechanisms

consisting of software alone are known to exist (i.e. software processors).

Claim Rejections - 35 USC § 102

5.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6.   Claims 1-4, 7-8, 12-15, 18-19, 23-26, and 29-30 rejected under 35 U.S.C. 102(e)

as being anticipated by Armstrong et al. (US PG Pub No. US 2002/0156824 A1

hereinafter Armstrong).

7.   Armstrong was disclosed in IDS dated 9/29/2005.

8.   Regarding claim 1, Armstrong teaches a machine-implemented method,

comprising:

        establishing a plurality of non-global operating system partitions within a global

operating system environment provided by the operating system, wherein each non-

global operating system partition serves to isolate processes running within that non-

global operating system partition from other non-global operating system partitions

within the global operating system environment, wherein enforcement of boundaries

between the non-global operating system partitions is carried out by the operating

system, and wherein the plurality of non-global operating system partitions comprises a

particular non-global operating system partition([0008] and [0026]);

        associating the particular non-global operating system partition with a first

resource pool comprising one or more resources ([0012]); and

ensuring that processes running within the particular non-global operating system

partition are allowed to utilize only the resources in the first resource pool ([0011],

wherein each logical partition is constrained to execute in an assigned processor set).

9.   Regarding claim 2, Armstrong teaches that the first resource pool comprises one

or more processors ([0010]).

10.   Regarding claim 3, Armstrong teaches that ensuring comprises: assigning work

from processes running within the particular non-global operating system partition to

only the one or more processors in the first resource pool ([0011], wherein each logical

partition is constrained to execute in an assigned processor set).

11.   Regarding claim 4, Armstrong teaches that the first resource pool comprises an

indication of a maximum amount of memory that can be consumed ([0023]).

12.   Regarding claim 7, Armstrong teaches that the operating system is executed on

a computer system, and wherein the resources in the first resource pool are just a

subset of a total set of resources available on the computer system ([0011-0012]).

13.   Regarding claim 8, Armstrong Teaches that ensuring comprises: associating

each process running within the particular non-global operating system partition with the

first resource pool ([0011], wherein each logical partition is constrained to execute in an

assigned processor set).

14.   Regarding claims 12-15, 18-19, 23-26, and 29-30, they are the machine-readable

medium and apparatus claims of claims 1-4, and 7-8 above. Therefore, they are

rejected for the same reasons as claims 1-4, and 7-8 above.

Claim Rejections - 35 USC § 103

15.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

16.   Claims 5-6, 9-11, 16-17, 20-22, 27-28, and 31-33 rejected under 35 U.S.C.

103(a) as being unpatentable over Armstrong et al. (US PG Pub No. US 2002/0156824

A1).

17.   Regarding claim 5, Armstrong does not explicitly teach that ensuring comprises:

          receiving, from a particular process running within the particular non-global

operating system partition, a memory allocation request; determining whether granting

the memory allocation request would cause the maximum amount of memory that can

be consumed to be exceeded; and in response to a determination that granting the

memory allocation request would not cause the maximum amount of memory that can be consumed to be exceeded, granting the memory allocation request.

18.   However, it is old and well known that operating system manage memory allocation requests and grant them accordingly. It would have been obvious to one of ordinary skill in the art to modify Armstrong to explicitly teach memory management.

19.   Regarding claim 6, Armstrong does not explicitly teach ensuring further comprises: in response to a determination that granting the memory allocation request would cause the maximum amount of memory that can be consumed to be exceeded, deallocating sufficient memory from one or more other processes to enable the memory allocation request to be granted without causing the maximum amount of memory that can be consumed to be exceeded; and granting the memory allocation request.

20.   Armstrong does teach that a separate OS manages each partition ([0035]). It is old and well known that OS can reallocation resources to ensure the efficient management of resources such as when a high priority process has an urgent processing target that needs to be met. It would have been obvious to one of ordinary skill in the art at the time of the invention to deallocate sufficient memory from one or more other processes to enable the memory allocation request to be granted without causing the maximum amount of memory that can be consumed to be exceeded and granting the memory allocation request. One would be motivated by the desire to ensure that high priority requests are granted.

21.   Regarding claim 9, Armstrong does not explicitly teach: receiving an indication that the particular non-global operating system partition is to be associated with a second resource pool instead of the first resource pool, wherein the second resource pool is different from the first resource pool, and wherein the second resource pool comprises one or more resources; associating the particular non-global partition with the second resource pool instead of the first resource pool; and ensuring that processes running within the particular non-global partition are allowed to utilize only the resources in the second resource pool.

22.   Armstrong does teach that resources can be reallocated to partitions depending on changing needs ([0009-0010]). It would have been obvious to one of ordinary skill in the art at the time of the invention to include modifying the resource pools. One would be motivated by the desire to dynamically reallocate resources to improve system performance as indicated by Armstrong.

23.   Regarding claim 10, Armstrong teaches that ensuring that processes running within the particular non-global operating system partition are allowed to utilize only the resources in the second resource pool comprises: associating each process running within the particular non-global partition with the second resource pool instead of the first resource pool ([0011], wherein each logical partition is constrained to execute in an assigned processor set).

24.   Regarding claim 11, Armstrong does not explicitly teach that the operating

system executes on a computer system, and wherein the method further comprises:

receiving, from a particular process running within the particular non-global operating

system partition, a request for information pertaining to all resources; and providing, to

the particular process, information pertaining only to the one or more resources in the

first resource pool, even though the computer system comprises other resources.

25.   Armstrong teaches that each partition is completely separated from each other

([0034]). It would have been obvious to one of ordinary skill in the art at the time of the

invention to provide information pertaining only to the one or more resources in the first

resource pool, even though the computer system comprises other resources. One

would be motivated by the desire to enforce isolation of partitions as indicated by

Armstrong ([0034]).

26.   Regarding claims 16-17, 20-22, 27-28, and 31-33, they are the machine-readable

medium and apparatus claims of claims 5-6, and 9-11 above. Therefore, they are

rejected for the same reasons as claims 5-6, and 9-11 above.

Response to Arguments

27.   Applicant's arguments filed 1/31/2008 have been fully considered but they are

not persuasive.

28.   Applicant argues on page 15:

"Several distinguishing points should be noted with regard to Armstrong. First of all, note that in Armstrong, it is the hypervisor (made up of portions 202 and 203), not the OS kernels, that establishes the logical partitions 204A-204D. As stated in paragraph 0037, lines 1-9, an administrator uses hypervisor portion 203 to create and/or alter logical partition definitions. Once the logical partitions are defined, the "hypervisor causes state values to be written to various hardware registers and other structures, which define the boundaries and behavior of the logical partitions" (paragraph 0037, last sentence). From these excerpts, it is clear that it is the hypervisor, which executes beneath the OS kernel level, that establishes the logical partitions 204A-204D. In contrast to the method of claim 1, it is not an operating system that establishes the partitions. There is no teaching whatsoever in Armstrong of having one of the OS kernels establish the partitions; thus, this aspect of claim 1 is clearly not taught or suggested by Armstrong."

29.   Examiner disagrees. Well not explicitly taught in Armstrong, as is well known in the art, a hypervisor is similar in function to an operating system such as claimed by Applicant. An operating system is defined as "the software that controls the allocation and usage of hardware resources such as memory, central processing unit time, disk space, and peripheral devices. The operating system is the foundation software on which applications depend (Microsoft Computer Dictionary, Fifth Edition, 2002). Armstrong teaches that a hypervisor enforces the logical partitioning of processor resources such as memory, and routing of I/O ([0034]). Since Armstrong clearly teaches that the hypervisor runs a layer above the hardware, the hypervisor is the foundation

upon which other operating system and applications can run. For these reasons, a

hypervisor is analogous to an operating system and read on the claimed invention.

30.   Applicant argues on pg 16:

"Another point to note is that, because the logical partitions 204A-204D in

Armstrong are not established by an operating system, they are not operating system

partitions. Put another way, they are not partitions established by an operating system

within an operating system environment provided by the operating system. If they were,

the partitions would look like the partitions shown in Fig. 1 of the present application,

wherein a plurality of non-global partitions 104 are shown within a global operating

environment 130 provided by an operating system. There is no such showing in

Armstrong. Instead, in Fig. 2 of Armstrong, each of the partitions 204A-204D is shown

as a separate partition, each of the partitions is shown as executing a separate OS

kernel, and none of the OS kernels show multiple partitions within it. Hence, unlike claim

1, the logical partitions of Armstrong are not operating system partitions, and they are

not established by an operating system within an operating system environment

provided by the operating system. This aspect of claim 1 is clearly not shown or

suggested by Armstrong."

31.   Examiner disagrees. Applicant's assertion that logical partitions that are not

established by an operating system are not operating system partitions is without merit.

One of ordinary skill in the art would know that an operating system partition is simply a

partition with a separate operating system. It is irrelevant as to what entity sets up such

a partition. Furthermore, as argued above, a hypervisor is equivalent to the operating

system as claimed. Armstrong teaches that hypervisor is used to created and alter

configuration of the partitions ([0025]). Applicant's description of Figure 1 does not

appear in the claim language.

32.   Applicant argues on pg 16:

        "Yet another point to note is that in Armstrong, it is the hypervisor 202, not the

OS kernels, that enforces the boundaries between the logical partitions. This is made

clear in the first sentence of paragraph 0034, which states: "Immediately above the

hardware is a common low-level hypervisor base 202, also called partitioning licensed

internal code (PLIC), which enforces logical partitioning". Thus, in contrast to claim 1 in

which it is the operating system that enforces the boundaries between operating system

partitions, the system of Armstrong does not employ any OS kernel (but rather, employs

the hypervisor) to perform the boundary enforcement function. This aspect of claim 1 is

neither disclosed nor suggested by Armstrong."

33.   Examiner disagrees. For the same reasons outlined above, the hypervisor,

playing the part of an operating system, does enforce the boundaries between the

logical partitions (Armstrong [0034]).

34.   Applicant argues on pg 16-17:

        "Yet another point to note is that in Armstrong, it is the hypervisor 202, not the

OS kernels, that ensures that tasks executing within a logical partition are allowed to

utilize only the resources assigned to that partition. In the last sentence of paragraph

0023, Armstrong makes it clear that each task is assigned to one of the logical

partitions, and hence, can use only the system resources assigned to that partition.

Also, in the first sentence of paragraph 0034, Armstrong makes it clear that it is the

hypervisor base 202 that enforces logical partitioning. Thus, from these excerpts, it is

clear that it is the hypervisor 202 that ensures that tasks executing within a logical

partition are allowed to utilize only the resources assigned to that partition. This is in

sharp contrast to claim 1 in which it is the operating system that ensures that processes

running within the particular non-global operating system partition are allowed to utilize

only the resources in the first resource pool. Using an operating system to ensure that

tasks executing within a logical partition are allowed to utilize only the resources

assigned to that partition is neither disclosed nor suggested by Armstrong."

35.   Examiner disagrees. For the same reasons outlined above, the hypervisor,

playing the part of an operating system, does enforce the boundaries between the

logical partitions (Armstrong [0034]).

36.   Applicant argues on pg 17:

       "Overall, Armstrong differs fundamentally from the method of claim 1 in that

Armstrong implements the partitioning function at a lower level than claim 1. As made

clear in the above arguments, the hypervisor is the component in Armstrong that

establishes and enforces the logical partitions. Since the hypervisor executes beneath

the OS kernel level (as shown in Fig. 2 of Armstrong), the system of Armstrong

implements partitioning at a level lower than the operating system level. In sharp

contrast, the method of claim 1 implements partitioning at the operating system level. As

a result, it is the operating system that establishes the partitions, enforces the partition

boundaries, and ensures that processes running within a partition are allowed to utilize

only the resources associated with that partition. Because the two methodologies are

implemented at fundamentally different operating levels of a computer system, it should

come as no surprise that Armstrong fails to disclose or suggest several aspects of claim

1. For at least the above reasons, Applicants submit that claim 1 is patentable over

Armstrong."

37.   Examiner disagrees. For the same reasons outlined above, the hypervisor,

playing the part of an operating system, does enforce the boundaries between the

logical partitions (Armstrong [0034]). Furthermore, Applicant's assertion that the

hypervisor executes beneath the OS kernel level is erroneous. The hypervisor, acting

as an operating system, executes at a lower level than the OS kernel of each of the

partitions as taught by Armstrong in Figure 2.

Conclusion

38.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

39.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Eric C. Wai whose telephone number is 571-270-1012.

The examiner can normally be reached on Mon-Thurs, 9am-5pm.

        If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Meng - Ai An can be reached on 571-272-3756. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

        Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Eric C Wai/
Examiner, Art Unit 2195

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